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erly set forth in the text by him under the different groups, by frequent comparison of their structures with those of the other groups.

In the first chapter, a general account of the whole class is given, including a *historical sketch*, the general *morphology*, the *embryology*, *phylogeny* (chiefly with regard to the fossil forms). The morphology treats of the morphological and anatomical details in the following sequence: exoskeleton (body, limbs, branchiæ), alimentary system, circulatory system, excretory system, nervous system and sense organs, glands, phosphorescent organs, reproductive system.

Of the following chapters, II. to V. treat of the Branchiopoda, Ostracoda, Copepoda and Cirripedia, and the same general arrangement of the subject matter as above is followed under each group. Chapter VI. gives a general morphological introduction to the subclass Malacostraca, defining their systematical divisions, and of the following chapters, VII. to XVI., each gives an account of one of the orders of the Malacostraca: Nebaliacea, Anaspidacea, Mysidacea, Cumacea, Tanaidacea, Isopoda, Amphipoda, Euphausiacea, Decapoda and Stomatopoda.

In the treatment of the various groups, the general arrangement is similar to that used in the introductions to the larger groups, but "remarks on habits," a more detailed discussion of "paleontology," and remarks on "affinities and classification" are added, and this is followed by a sketch of the system, which gives diagnoses of the main systematical divisions of each order, bringing it down to the families and genera, the former of which are quoted rather completely by name, while of the latter the most important ones are named.

The different orders have received a rather uniform treatment, which is a feature of the book which should be especially mentioned, for we may sometimes observe, in similar treatises, that the author is not quite impartial, devoting, for obvious reasons, more time and space to those groups to the study of which he has applied himself more energetically. Calman has avoided this, and thus the whole book makes the impression of a carefully

planned and well-executed attempt to give an account of the morphology, anatomy and embryology of the whole class. At the same time, nothing of importance has been omitted. Of course the remarks on habits and on paleontology are rather short, and might be regarded as unsatisfactory, but we are to consider that the book forms a part of a series entitled, "A Treatise on Zoology," and not of ecology or paleontology, and thus these sides could not have been considered to any extent in a book of this character. For the same reason also remarks on geographical distribution are omitted.

The book preeminently is a zoological treatise, dealing with the purely zoological side of the matter: morphology, anatomy, embryology and the systematics. With regard to this, it is a complete success, and should be used, by zoologists, not only by the side of other textbooks, but is apt to supersede the latter, thus becoming, for the present time, the standard text-book on crustaceans. Anybody desiring to get any information within the range as defined above will surely find it here, and not only this, but he will find the account given up to date. A rather complete index will serve to facilitate the search for the desired information, and references to literature at the end of the various chapters will give a direction for the study of further particulars.

A. E. ORTMANN

Lehrbuch der Paläozoologie. Von E. STROMER VON REICHENBACH. I. Theil: Wirbellose Tiere. Pp. 342; 398 text figures. Leipzig, Teubner. 1909. Price 10 Marks in cloth.

Von Stromer presents here an excellent elementary text-book of paleontology, written in good style and not too technical in language. It deals with the fossil invertebrates viewed almost entirely from the biologic standpoint, and while the geologic development is also presented, it is too much abbreviated to be of much value from the side of evolution or stratigraphy. The illustrations are excellent half-tones of wash-drawings made especially for the work. The printing, of course, is the best and the weight of the book not heavy.

All of the classes of invertebrates found fossil are described in more or less detail according to the prominence of the classes. These are taken up first in a general way to acquaint the student with the hard parts and the relation of the soft parts to them. The orders and suborders adopted are up to date and these are next concisely described, but no further classification is offered, nor are the genera, even the common genera, defined. The various groups are illustrated by a few well-selected forms and these are carefully described in the legend as to the source whence obtained, the name of the animal, locality and formation, order or family and the symbols referring to the detailed structures.

Most of the classes are adequately treated for an elementary work, but a few are handled too briefly to give a proper conception of their intricacy. For instance, the crinoids are described in nine pages and the horde of Camerata in one, the Hydrophorida or Cystidea proper in four, the starfishes and ophiurids each in three, and the varied and very important Paleozoic trilobites in six. American paleontologists will be also disappointed to see the Trepotomata Bryozoa still ranged among the tabulate corals.

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Light. By RICHARD C. MACLAURIN, President of the Massachusetts Institute of Technology. New York, published by the Columbia University Press. 1909.

A popular exposition of selected topics, being the Jesup lectures delivered at the American Museum of Natural History during the winter of 1908-9. This book, while not comprehensive enough to serve as a text-book, will meet the requirements of those who wish to acquaint themselves with the experimental part of the work that has given us our modern theory of light. The subjects are treated in the following order: (1) Early Contributions to Optical Theory, (2) Color Vision and Color Photography, (3) Dispersion and Absorption, (4) Spectroscopy, (5) Polarization, (6) The Laws of Reflection and Refraction, (7) The

Principle of Interference, (8) Crystals, (9) Diffraction, (10) Light and Electricity. The author's standing as a physicist is a sufficient guarantee that the book is free from errors, and the subject is treated in a very readable manner, free from mathematics and requiring little or no previous knowledge of the subject on the part of the reader. It brings the subject down to date, or as much so as can be expected in a popular treatment.

R. W. WOOD

RECENT VIEWS OF L. CUENOT ON THE
ORIGIN OF SPECIES BY MUTATION¹

THE results obtained in the study of variation from the point of view of its origin, of its morphological significance and of the integral transmission of mutations as opposed to fluctuations, could not but exert a profound influence on the hypotheses that have been brought forward to explain evolution. It is of particular interest to compare these results with the classic theories of Lamarck and Darwin. Primarily, these are attempts to account for the phenomena of adaptation: Lamarck invokes use and disuse, effort and habit, and considers their effects as directly adaptive and hereditary; thus he explains the evolution of organs necessary for life in certain surroundings and the regression of those that are useless under an animal's particular environmental conditions.

Darwin, while admitting the effects of use and disuse, emphasizes above all the selection of minute fluctuating variations, favorable in the struggle for existence, and thus he explains morphological changes and the final perfection of adaptation in an organ as the result of a slow and continuous progress.

To be sure, the sudden appearance of certain mutations, transmissible in their entirety, and the instability of fluctuating variations, are factors not at all in accord with Lamarck's attempted explanation, nor with that of Darwin; but perhaps there are no longer many

¹ Cuenot, L., 1908, "Les Idées Nouvelles sur l'Origine des Espèces par Mutation." Translated from *Rev. gén. Sci. pures et appliq.*, Ann. 19, no. 21, 15 nov., 1908.